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Designing Organizational Management and Blockchain-based Information System Architecture in the Bamboo Creative Industry Center

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ABSTRACT

Indonesia boasts a wide range of bamboo species and is among the largest manufacturers of bamboo in Asia. However, the Garut Bamboo Creative Industry Center, one of Indonesia's bamboo industries, encounters various challenges in managing this industry. This study is assumed to recognize the need for adaptation to changing times and more efficient management in the bamboo industry supply chain. The aim is to design an organization management and information system architecture based on blockchain technology. The methodology applied the Star Model and prototyping approach, leading to the development of a strategy, an association-based organizational structure, structured business processes, a balanced reward system, and the placement of human resources based on their qualifications. It enables product tracking and increases operational efficiency by integrating blockchain technology into warehouse and production information systems. It also proposes innovative solutions to ensure growth and sustainable development. The study suggests recommendations, including implementing blockchain technology as a product management and supply chain enhancement solution to support the bamboo company's growth and aspirations.

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1. INTRODUCTION

The bamboo industry is an economic sector that is increasingly developing and has a significant impact in Indonesia (Amorita et al., 2021). The diversity of bamboo types and significant economic potential have made the bamboo industry an essential pillar in local and national economic growth. Survey results by the Bamboo and Rattan Organization (INBAR) in 2020 stated that sales of bamboo products continued to increase, especially in developing countries such as Indonesia, China, and India. Apart from that, Indonesia is also one of the largest bamboo producers in Asia, with various bamboo species, including endemic species only found in Indonesia (Junqi et al., 2021).

The Bamboo Creative Industry Center in the Selaawi subdistrict, Garut district, West Java, is one of the areas with the image of a bamboo city. The availability of bamboo raw materials and human resources has developed the bamboo craft business in the sub-district.

Even though the Garut Bamboo Creative Industry Center has great potential, this sector still faces several challenges. First, adaptation to current developments is one of the main problems faced. Second, monitoring the quality of bamboo products has yet to be optimal, and the management of raw materials that are less efficient is also a significant challenge. Third, in the current digital era, reliable data management and information systems are crucial to support the growth and sustainability of the bamboo industry.

This research has high urgency because the development of the bamboo industry not only has the potential to improve local economic prosperity but also plays an essential role in promoting sustainable natural resources and using advanced technology in business management. Comprehensive solutions are needed to overcome these challenges and ensure the sustainable growth of the bamboo industry.

One of the significant gaps in this research is the lack of structured organizational management within the Garut Bamboo Creative Industry Center. While previous studies have examined various aspects of the bamboo industry, there is a dearth of research addressing optimal organizational management design and the application of Blockchain technology in data management and tracking of bamboo products. Blockchain, a decentralized ledger technology secured by cryptographic algorithms, offers robust protection against unauthorized data manipulation (Casino et al., 2019). This technology presents opportunities for developing innovative digital platforms and services across multiple industries, extending beyond financial services to sectors such as healthcare, logistics, and manufacturing (Choi et al., 2019). In the context of industrial management, Blockchain can potentially address critical issues, particularly in security and supply chain transparency (Kshetri, 2018). Specifically for the bamboo industry, Blockchain technology can be leveraged to record transaction data of Selaawi bamboo products, thereby ensuring product quality and traceability (Köhler & Pizzol, 2019). This application of Blockchain in the bamboo sector not only enhances product authenticity but also aligns with sustainable development goals by promoting transparency and efficiency in resource management (Saberi et al., 2018).

This research integrates organizational management aspects and the application of Blockchain technology to improve operational efficiency, data security, and transparency in the bamboo industry supply chain. Therefore, this research aims to design optimal organizational management and integrate Blockchain technology into the information system at the Bambu Garut Creative Industry Center. Thus, this research can provide a more holistic and sustainable solution to support the growth of the bamboo industry and, at the same time, contribute to the development of the bamboo industry nationally and globally.

2. LITERATURE REVIEW

2.1. Organizational management

Organizational management (Daft&Armstrong, 2021) and Kinicki and Williams (2018), encompasses planning, organizing, leading, and controlling resources to achieve organizational goals efficiently and effectively. In the context of industrial organization management, particularly the bamboo industry, these principles are applied to study how companies operate and compete (Kaehler et al., 2019). Sharma et al. (2019) demonstrated that effective organizational management can enhance productivity and sustainability in the bamboo industry. However, Zhang & Liu (2020) identified specific challenges in bamboo supply chain management, necessitating innovative approaches.

2.2. Star model

The star model for organizational design is the foundation on which a company bases its design choices. The framework comprises design policies that management can control and influence employee behavior. Policies are essential tools for effective organizational decision-making and behavior management. These policies (Figure 1) are grouped into five categories, beginning with the strategy section, which outlines the direction to be adopted. The second section describes the structure and the location of the decision-making authority. Third is a process related to the flow of information; they are a means of responding to technological information. Fourth is rewards and reward systems, which influence people's motivation to carry out and achieve organizational goals. The fifth category of the model consists of policies related to people (human resource policies), which influence and often determine the mindset and skills of employees (Galbraith, 2009).

2.3. Digital supply chain

According to Fahrani et al. (2017) define digital supply chain as the use of innovative digital technology to change traditional ways of (1) carrying out supply chain planning and implementation tasks, (2) interacting with all types of supply chain participants, and (3) enabling new corporate business model (Farahani et al., 2017). According to Büyüközkan & Göçer (2018), a digital supply chain is "the most suitable intelligent technological system based on massive data release capabilities and excellent cooperation and communication for digital hardware, software, and networks to support and synchronize interaction between organizations by making services more valuable, accessible and affordable with consistent, agile and effective results" (Büyüközkan & Göçer, 2018). Based on this definition, a digital supply chain can be considered a new approach with innovative technologies that can change traditional supply chain operations to achieve better and more efficient integration between supply chain members.

2.4. Blockchains

Blockchain technology is a distributed database through cryptographic technology that guarantees that the distributed ledger cannot be changed, and smart contracts consisting of script code allow transactions to be executed

automatically (Juma et al., 2019). In technical terms, Blockchain refers to a distributed ledger consisting of a series of data blocks connected through cryptographic methods (Zachariadis et al., 2019).

Each block contains a set of transaction information from the network. As illustrated in Figure 2, the block is a header and a body (Liu & Li, 2020). The block header stores information used to link to the previous block and information used for verification, including version number, hash value of the previous block, timestamp of the current block's write time, target nonce, and difficulty level used to prove workload difficulty, and the total hash of Merkle tree roots to verify block body transactions (Azzi et al., 2019). The block body contains transaction information and a Merkle tree of all transaction information (Pandey & Litoriya, 2020). In Figure 2, "T" represents "transaction."

In a Blockchain network, any two nodes can carry out transactions, and each transaction is broadcast by one node to all nodes throughout the network (Frizzo-Barker et al., 2020). Information is linked in the Blockchain when all nodes confirm that the record is correct, and this process relies on the consensus mechanism of the Blockchain network (Feng et al., 2020). The distributed structure allows each node to record all transaction information, and each node updates and stores all information from the entire network in real-time (Hughes et al., 2019). Blockchain technology involves three technological innovations: cryptography, consensus mechanisms, and smart contracts (Lim et al., 2021).

2.5. Prototyping

The prototyping process begins with gathering customer requirements to develop software. Prototyping programs developed to improve customer visualization of desired product features. Prototypes are typically incomplete programs. This program usually displays a software flow simulation to look like finished software. This program usually displays a software flow simulation to look like finished software. The customer or user evaluates this prototype program until the specifications match the customer's or user's wishes (Ahmed & Demirel, 2020; Shah, 2001).

2.6. Unified modelling language

Unified Modeling Language (UML) has emerged as a standardized visual language widely adopted in the industrial sector for defining requirements, conducting analysis and design, and describing architecture in object-oriented programming (Reggio et al., 2014). The fundamental objective of this modeling approach is to facilitate the comprehension and analysis of complex systems (Hutchinson et al., 2014). UML encompasses a diverse range of diagrams, including class diagrams, object diagrams, use case diagrams, sequence diagrams, collaboration diagrams, state chart diagrams, activity diagrams, component diagrams, deployment diagrams, package diagrams, composite structure diagrams, timing diagrams, interaction overview diagrams, and communication diagrams (Georgiev & Stefanova, 2014). These diagrams serve various purposes in software development, from conceptual modeling to detailed system design and implementation (Górski & Bednarski, 2019). Recent studies have shown that UML continues to evolve, with new extensions and profiles being developed to address the changing needs of modern software development, particularly in areas such as cloud computing, Internet of Things (IoT), and cybersecurity (Thramboulidis & Christoulakis, 2016).

3. METHODS

This research adopts a mixed-method approach, combining qualitative and quantitative analysis to design organizational management aligned with blockchain-based information systems. We employ the Design Science Research (DSR) framework proposed to ensure rigor in information system artifact design (Peffers et al., 2007), while integrating elements from the Star Model (Galbraith, 2009) For organizational management design.

3.1. Research stages

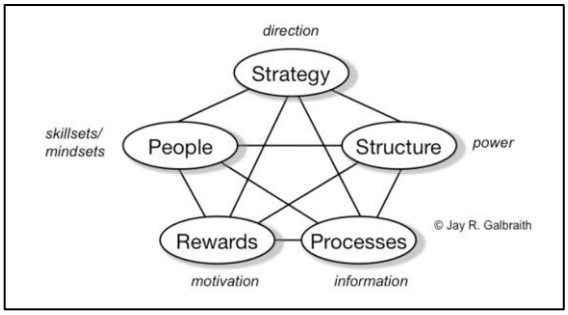

Figure 1. Star Model by Jay R. Galbraith

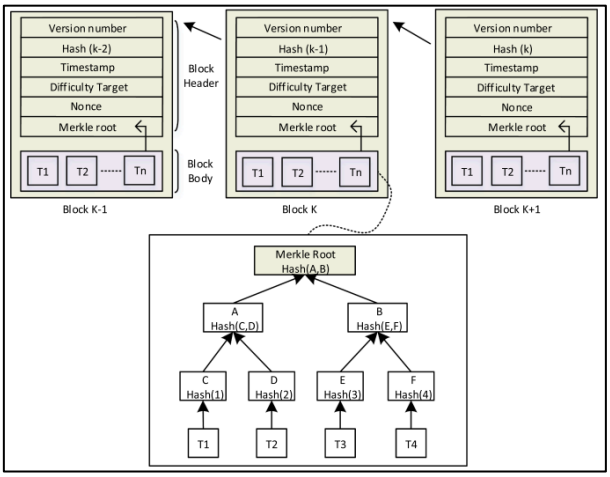

Figure 2. Blockchain Structure

a. Problem identification and communication:
   1) Conduct semi-structured interviews with stakeholders in the Garut bamboo industry.
   2) Analyze information system needs and requirements.
   3) Identify challenges in current organizational management.
b. Organizational management design:
   Use the star model approach to design:
   1) Strategy: SWOT analysis to formulate organizational strategy.
   2) Structure: Design an organizational chart supporting blockchain integration.
   3) Processes: Business process mapping accommodating blockchain technology.
   4) Rewards: Performance-based reward system encouraging blockchain adoption.
   5) People: RACI Matrix analysis to determine roles and responsibilities in the new system.
c. Blockchain-based information system design:
   1) Develop use case diagrams to illustrate user interactions with the system.
   2) Design class diagrams to represent data structures and relationships in the blockchain system.
   3) Design information system architecture integrating blockchain with existing business processes.
d. Modelling:
   Create mock-ups or initial models of the information system interface using prototyping software.
e. Evaluation and comparison
   Perform comparative analysis between the proposed blockchain-based information system and classical systems, covering aspects of: 1) Data decentralization; 2) Transparency and auditability; 3) Security and privacy; 4) Automation (smart contracts vs. traditional business logic); 5) Scalability and performance.

3.2. Data analysis

Qualitative data from interviews will be analyzed using thematic analysis (Braun & Clarke, 2006). Quantitative data from simulations and comparative analysis will be analyzed using appropriate descriptive and inferential statistics.

3.3. Research ethics

This research will be conducted in accordance with research ethics principles, including informed consent from all participants and data confidentiality protection.

Through this methodological approach, we aim to produce an organizational management design integrated with a blockchain-based information system, specifically tailored to the needs of the bamboo industry in Garut.

4. RESULTS AND DISCUSSIONS

4.1. Communication

Designing organizational management for the bamboo industry requires the right strategy to achieve goals. In this case, SWOT analysis allows the bamboo industry to formulate strategies, prioritize required actions, and adapt plans according to changes in the business environment. To carry out a SWOT analysis, it is necessary first to identify internal and external factors relevant to the bamboo industry. Next, calculate the weights, ratings, and scores for these factors (Table 1).

The IFAS (Internal Factors Analysis Summary) calculation produces a score of 0.66, indicating that the bamboo industry has several significant internal factors, including strengths and weaknesses, that are relevant to organizational performance. Thus, the bamboo industry has strengths that can be optimized and weaknesses that must be corrected.

The EFAS (External Factors Analysis Summary) calculation produces a score of 0.81 (Table 2), indicating that the bamboo industry has several significant external

Table 1. Internal Factors

Internal Factors		Weight	Rating	Score
Strength	Superior product quality	0.10	4	0.40
	Local raw materials	0.12	4	0.48
	Environmentally friendly	0.12	4	0.48
	Innovation potential	0.09	3	0.28
	Labor skills	0.11	3	0.33
	Total *Strength*			1.96
Weakness	Weakness Limited infrastructure	0.09	3	0.28
	Lack of marketing and promotion	0.09	2	0.18
	Limited production scale	0.08	2	0.17
	Dependence on the local market	0.10	4	0.40
	Unstable supply chain	0.09	3	0.28
	Total Weakness			1.30
Total IFAS		1		0.66

Table 2. External Factors

External Factors		Weight	Rating	Score
Opportunity	Increased market demand	0.12	4	0.46
	Government support	0.10	4	0.38
	Export market potential	0.13	3	0.38
	Technological innovation	0.13	4	0.50
	Industrial collaboration	0.12	3	0.35
	Total Opportunity			2.07
Threat	Threats of competition from substitute materials	0.13	4	0.50
	Environmental threats such as land use change and erosion	0.07	3	0.20
	Raw material price fluctuations	0.06	2	0.12
	Changes in government policy	0.10	3	0.29
	Economic recession	0.08	2	0.15
	Total Threat			1.26
	Total EFAS	1		0.81

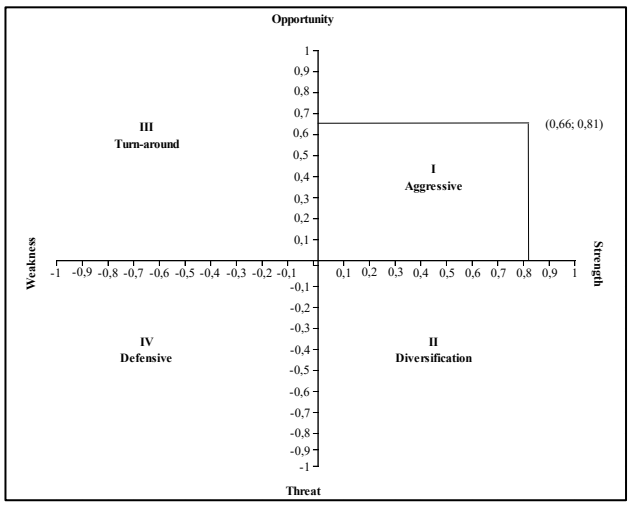

Figure 3. SWOT Analysis Diagram

factors, including market opportunities and threats that need to be faced. So, the bamboo industry needs to take appropriate action to overcome these market opportunities and threats. A SWOT matrix is obtained based on the results of IFAS and EFAS calculations.

The diagram (Figure 3) results show that the bamboo industry is in quadrant I, which means aggressive. The bamboo industry has a competitive advantage and can exploit the market. Strategic plans are formulated based on the results of this analysis in Table 3.

Furthermore, the organizational chart in the Garut bamboo industry produces an organization in the form of an association (Figure 4). Association-type industries aim to facilitate collaboration, build networks between stakeholders, and fight for sustainability and policies that support the bamboo industry. As an association, the bamboo industry can allocate resources efficiently, develop quality standards and business ethics, and provide counseling, training, and support in increasing competitiveness and environmentally friendly business practices. With this, bamboo organizations can achieve common goals, strengthen their position in the market, and play a role in environmental conservation through a collaborative approach.

The RACI Matrix (Table 4) aims to manage people or human resources in designing organizational management in the bamboo industry.

The results of human resource design using the RACI Matrix method and job analysis describe the roles and responsibilities of each position in the bamboo industry. Creates a clear organizational structure and detailed role definitions, enabling the organization to optimize the deployment of human resources according to its strategic objectives. Next, use business process mapping to describe business processes by showing business processes from start to finish. Business process mapping aims to identify and understand the business processes (Figure 5).

Table 3. SWOT Analysis Strategy Matrix

IFAS / **EFAS**	***Strength***	***Weakness***
	1. Superior product quality. 2. Local raw materials. 3. Environmentally friendly. 4. Innovation potential. 5. Labor skills.	1. Weakness Limited infrastructure. 2. Lack of marketing and promotion. 3. Limited production scale. 4. Dependence on the local market. 5. Unstable supply chain.
Opportunity	**Strategi SO (*Strength - Opportunity*)**	**Strategi WO (*Weakness - Opportunity*)**
1. Increased market demand. 2. Government support. 3. Export market potential. 4. Technological innovation. 5. Industrial collaboration.	1. Allocate more resources to increase production and ensure adequate supply to deal with surges in demand (S1, O1). 2. Utilize product quality to enter the export market by implementing an international marketing strategy. (S1, O3). 3. Collaborate with the government to implement sustainable environmental programs. (S3, O2). 4. Allocate research and development funds to exploit the potential of technological innovation. (S4, O4). 5. Establish partnerships with other industries that require special skills possessed by the workforce. (S5, O5).	1. Collaborate with the government to improve bamboo industrial infrastructure to overcome production and distribution barriers. (W1, O2). 2. Allocate more resources for marketing and promotional strategies. (W2, O1). 3. Establish cooperation with related industries to utilize larger production facilities. (W3, O5). 4. Take advantage of export market opportunities to reduce dependence on the domestic market. (W4, O3). 5. Using technology such as blockchain to monitor and manage supply chains more effectively. (W5, O4).
Threat	**Strategi ST (*Strength - Threat*)**	**Strategi WT (*Strength - Threat*)**
1. Threats of competition from substitute materials. 2. Environmental threats such as land use change and erosion. 3. Raw material price fluctuations. 4. Changes in government policy. 5. Economic recession.	1. Maintain superior product quality. (S1, T1). 2. Utilization of local raw materials to reduce the impact of uncontrollable fluctuations in raw material prices. (S2, O3). 3. Market diversification to secure revenue and market share. (S3, T1). 4. Innovate products and production processes to overcome competition from substitute materials. (S4, T1). 5. Utilize government support to address changes in government policy. (S5, T4).	1. Increase marketing or promotions. (W2, T1). 2. Looking for a more stable raw material procurement method in the face of price fluctuations. (W3, T3). 3. Market diversification to create higher added value for the local market, reduce dependence on one product, and reduce the risk of changes in government policy. (W4, T1, T4). 4. Increase marketing or promotions. (W2, T1).

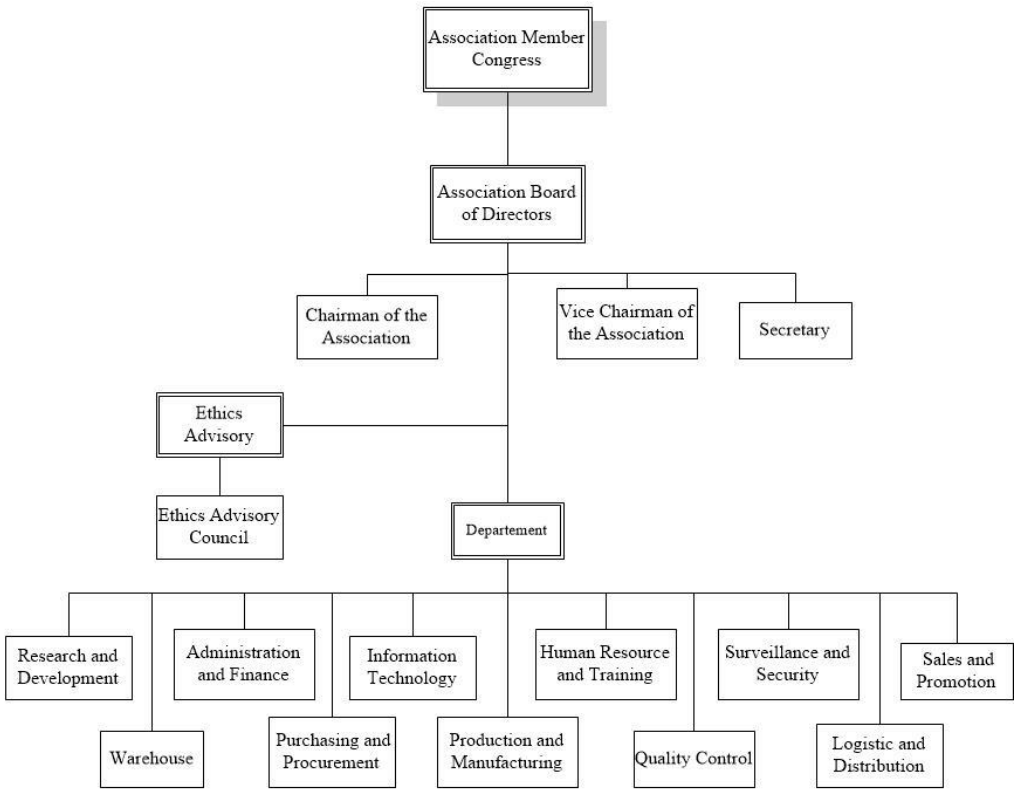

Figure 4. Organizational Chart

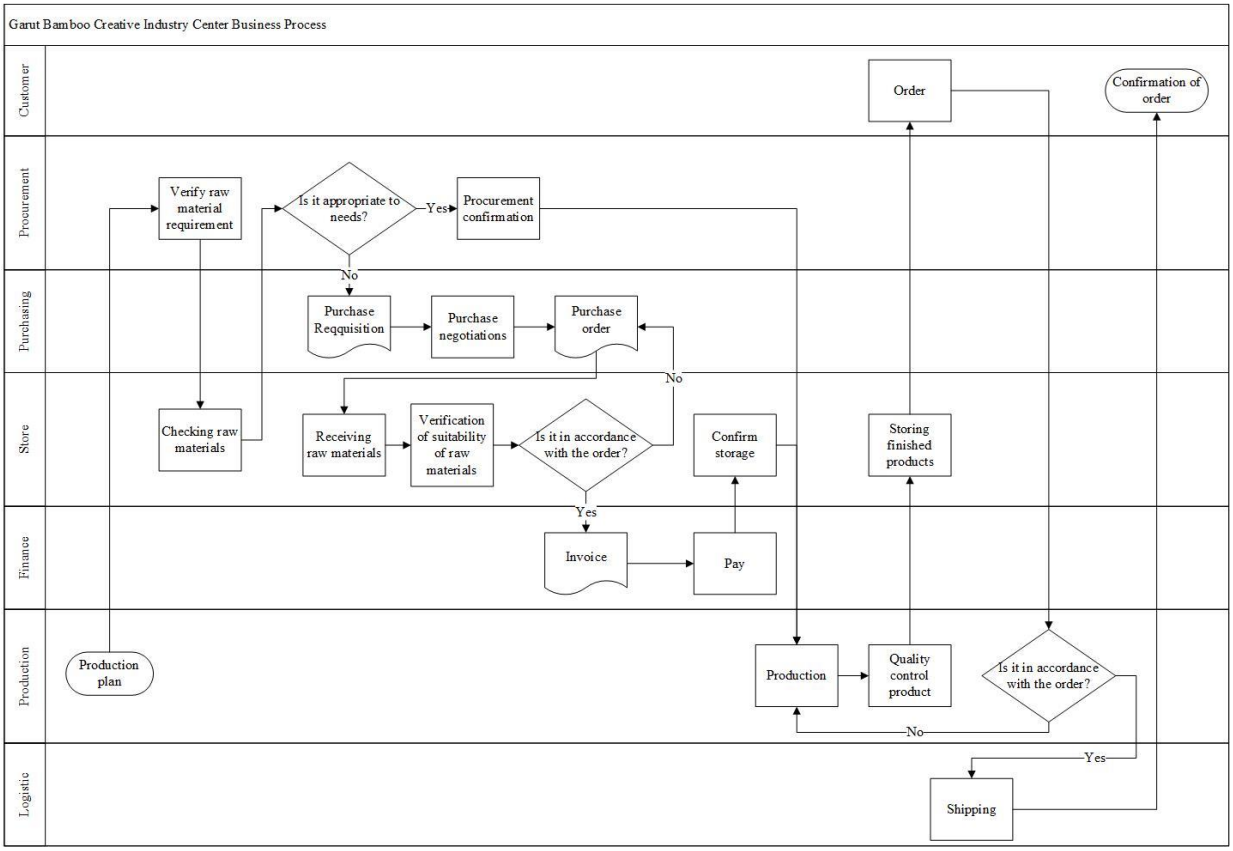

Figure 5 Business Process Mapping Garut Bamboo Industry

Table 4. RACI Matrix

Job \ Position	Chairman of the Association	Vice Chairman of the Association	Secretary	Ethics Advisory Council	Research and Development	Administration and Finance	Human Resources and Training	Information Technology	Sales and Promotion	Surveillance and Security	Warehouse	Purchasing and Procurement	Production and Manufacturing	Quality Control	Logistics and Distribution
Preparation of raw materials	-	-	-	-	-	-	-	R	-	-	A	A	-	-	I
Production of bamboo products	-	-	I	-	-	I	-	R	-	C	-	-	A	A	I
Bamboo product testing	-	-	-	-	-	-	-	-	-	C	-	-	I	A	I
Marketing of bamboo products	-	-	I	-	-	C	-	-	A	-	-	-	-	-	C
Sales of bamboo products	-	-	I	-	-	C	-	-	R	-	-	-	-	-	C
Research and development of bamboo products	C	C	I	-	R	-	-	-	C	-	-	-	-	-	-
Product innovation	C	C	I	-	R	-	-	-	C	-	-	-	-	-	-
Collaboration with related parties	A	C	I	C	-	-	C	-	I	-	-	-	-	-	-
Network development and cooperation	A	C	I	I	-	-	C	-	I	-	-	-	-	-	C
Supply chain management	-	-	-	-	-	-	-	-	I	R	C	R	I	-	A
Stock management and distribution	-	-	-	-	-	-	-	-	-	R	R	R	R	-	A

Information:
R (Responsible): Responsible for the execution of duties.
A (Accountable): Responsible for results and decisions.
C (Consulted): Consulted in decision-making.
I (Informed): Informed about progress and results.

Furthermore, designing a reward system increases the bamboo industry's motivation, performance, and satisfaction. Using industry comparative analysis in reward systems is expected to balance intrinsic and extrinsic rewards to motivate employees, improve performance, and achieve organizational goals. Performance criteria for implementing the reward system include achieving production targets, product quality, innovation, teamwork, and participation in projects, including:

a. Intrinsic rewards
   1) Recognition and appreciation
      Recognition and appreciation programs involving public awards, monthly awards, and recognition of employee contributions and initiatives.
   2) Career development
      Employees can access career development programs, including training, opportunities to participate in innovative projects, and continuing education.

Figure 6. Use Case Diagram of Warehouse and Production Information Systems

3) Work-life balance
   Flexibility in work schedules is provided to employees to achieve a balance between work life and personal life.
4) Participation in decisions
   Employees can participate in decision-making and provide input regarding organizational changes or improvements.

b. Extrinsic rewards
1) Base salary
   Employees will receive a base salary commensurate with their position and experience level. This salary will be considered competitive with the labor market.
2) Annual performance bonus
   Employees who meet or exceed performance targets will be eligible to receive an annual bonus. Achievement can be assessed based on individual and team performance.
3) Health and welfare benefits
   Employees will get health benefits that include health insurance and other welfare benefits.

4.2. Design

a. Use case diagram
1) Use case warehouse and production information system
   This use case diagram (Figure 6) depicts the interaction between various actors and functions in the bamboo industry, representing the organization operating in supply chain and product management. The primary use cases in this information system include procurement and purchasing of raw materials by procurement and purchasing staff, warehouse management by warehouse operators, production management by production managers and quality control staff,

management of cost of goods in manufacture, and system management by admin.

2) Use case sales information system
This use case diagram (Figure 7) describes the interaction between actors and the bamboo product sales system. The primary use cases in this information system include system management by admins and product purchases by customers.

b. Class diagram

1) Class diagram warehouse and production information system
Warehouse and production information system class diagrams (Figure 8) help detail how each entity interacts and relates to each other in the inventory management environment and production process. The main entities of this class are products, procurement, purchase orders, inventory, and production processes.

2) Class diagram sales information system
The sales information system class diagram (Figure 9) helps describe the system structure, focusing on the classes or entities involved in the sales management of bamboo products. The main entities of this class are customer, product, and order.

4.3. Modelling

a. Mock-up system

1) Warehouse and production system mock-up
The inventory mock-up (Figure 10) represents a visual concept of the user interface display in an inventory management system, displaying a list of products with information such as name, identity number, category, and stock amount. The system includes search elements, adding new items, or editing products.
The mock-up production plan (Figure 11) represents a visual of the production plan for a product by displaying elements such as production schedule, workflow, resource allocation, and other graphic displays. Use this mock-up to design and visualize how production will occur before the production process begins. Using a mock-up production plan, the production team can understand how the workflow will progress, identify potential problems, and plan resource allocation more efficiently, thereby enabling better planning in the production process.

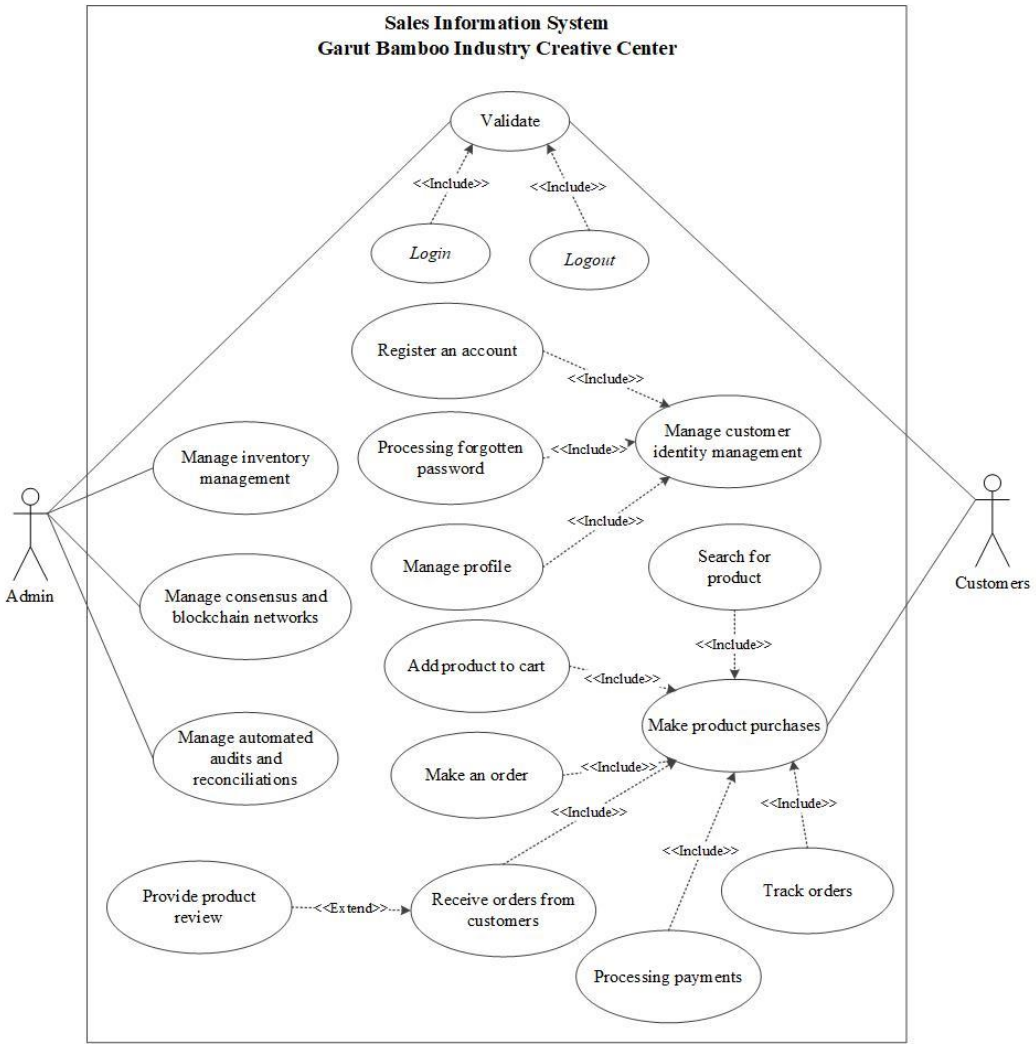

Figure 7. Use Case Diagram of Sales Information Systems

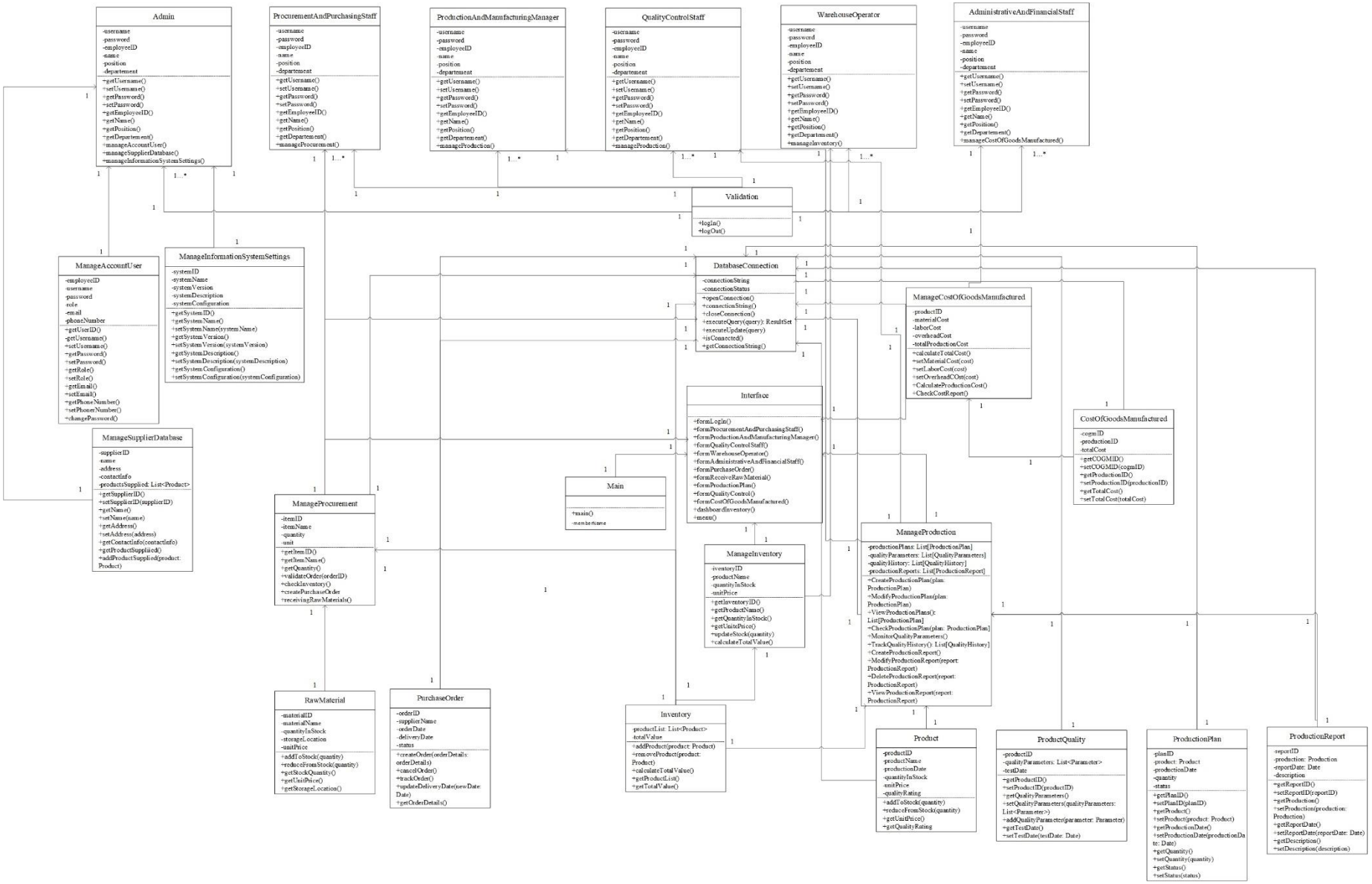

Figure 8. Class Diagram of Warehouse and Production Information System

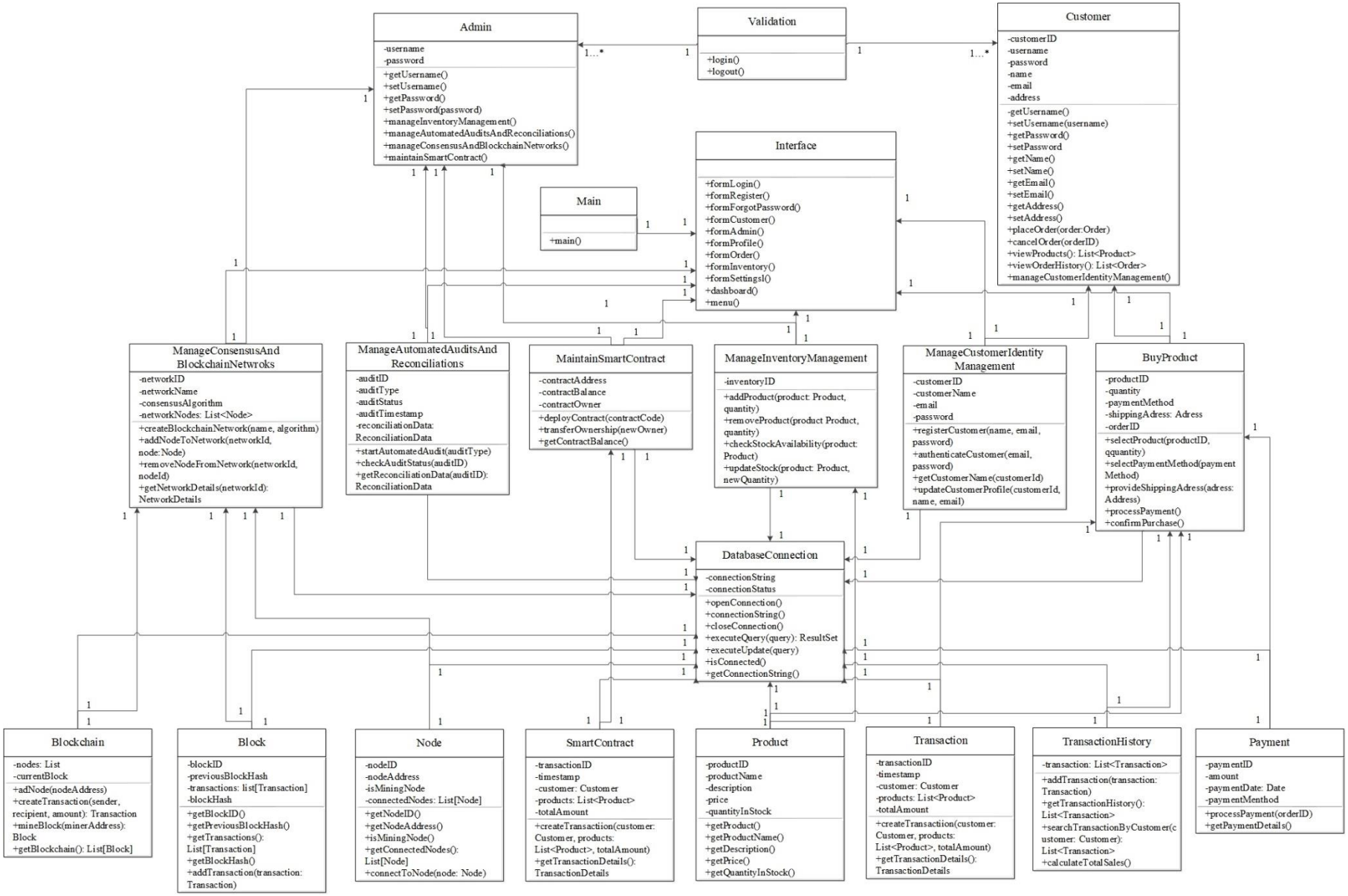

Figure 9. Class Diagram of Sales Information System

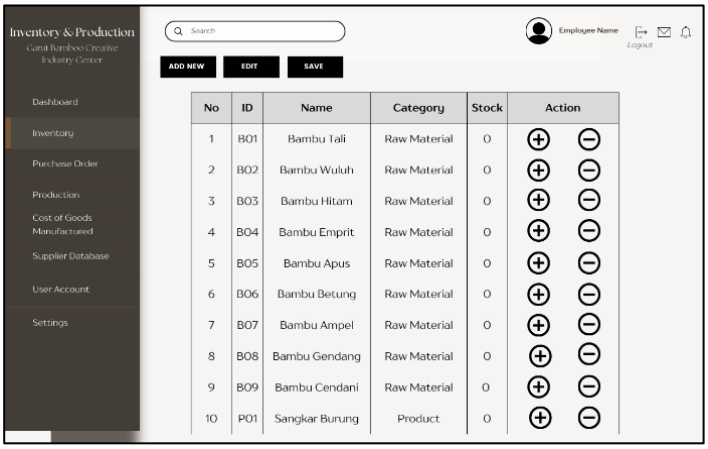

Figure 10. Mock-up Inventory

Figure 11. Mock-up Production Plan

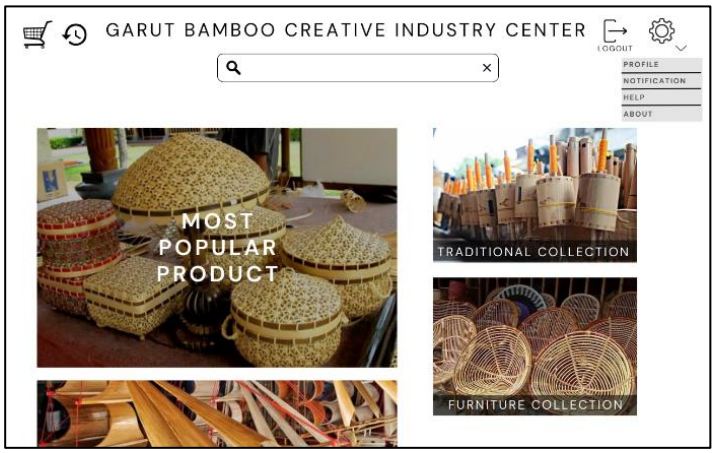

Figure 12. Mock-up Dashboard Sales

2) Sales information system mock-up

The sales system dashboard mock-up (Figure 12) represents a visual of the user interface used to monitor and analyze Bambi product sales data. This mock-up includes elements such as graphics and information related to the sale of bamboo products.

The payment mock-up (Figure 13) represents a visual of the user interface used in payment or financial transactions. This mock-up includes the payment form, available payment methods, transaction details, payment amount, payment button, and delivery service confirmation. Design this mock-up to provide users with a smooth and secure experience when carrying out financial transactions, ensuring that all the necessary information is available and accessible to access.

b. Blockchain architecture

The proposed blockchain system (Figure 14) for the bamboo industry integrates a framework with a

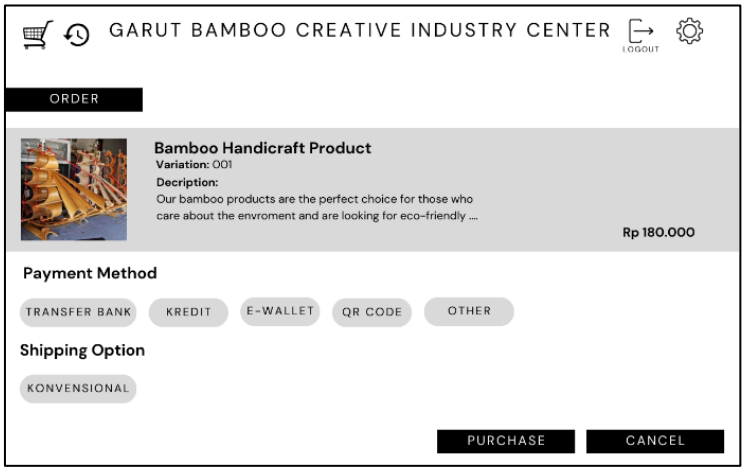

Figure 13. Mock-up Payment

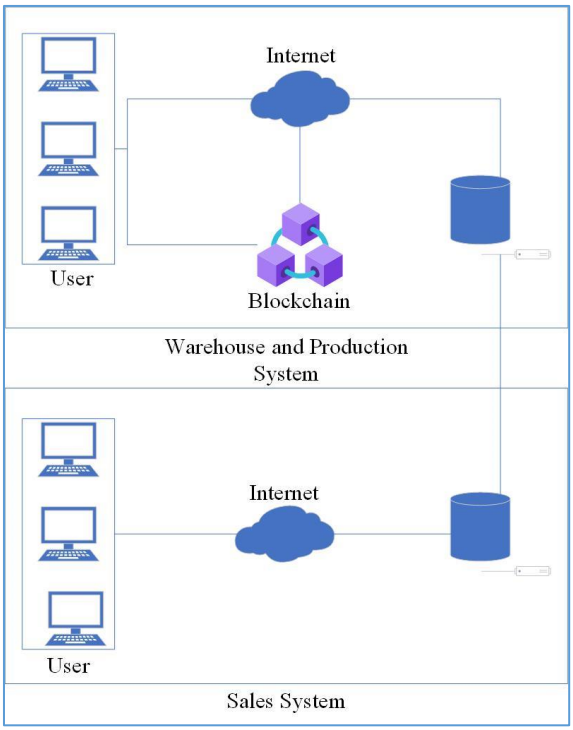

Figure 14. Blockchain Architecture

private blockchain using a Proof of Authority (PoA) consensus mechanism (Xu et al., 2019). This system incorporates smart contracts to automate supply chain tracking and quality verification. The architecture comprises two key information systems: warehouse and production, and sales. The warehouse and production system records detailed product information, including bamboo type, unique product codes, names, production dates, and prices, in a blockchain-connected database. The sales system serves as a trading platform, dynamically accessing the warehouse database to provide real-time product information to consumers. Each sale generates a unique transaction record and barcode, applied to physical products for traceability. This integration of barcode functionality with blockchain-recorded transaction traces enhances security and transparency in product origin tracking, offering a comprehensive solution for managing and verifying the bamboo product lifecycle from production to sale.

4.4. Comparison of blockchain-based information systems and classical information systems

Table 5 presents a comparison between the proposed blockchain-based information system and classical systems. The comparison between blockchain-based and classical information systems reveals a nuanced landscape of trade-offs particularly relevant to the bamboo industry. Blockchain technology offers significant advantages in transparency and security, crucial for maintaining product authenticity and supply chain integrity in the bamboo sector (Saberi et al., 2018). The cryptographic foundations of blockchain provide robust protection against data manipulation, a critical factor in preserving the integrity of production and supply

Table 5. Comparison of Blockchain-Based Information Systems and Classical Information Systems

Aspect	Blockchain-Based System	Classical System
Decentralization	Data distributed across all nodes	Centralized data on servers
Transparency	All transactions are traceable	Limited to granted access
Security	Cryptography and consensus	Traditional firewall and encryption
Automation	Smart contracts	Centralized business logic
Scalability	Limited by consensus	Easier to scale up

chain data (Choi et al., 2019). Furthermore, the automation capabilities of blockchain through smart contracts present opportunities for streamlining supply chain operations, potentially revolutionizing inventory management and order fulfillment in the bamboo industry (Lim et al., 2021). However, blockchain systems face challenges in scalability, particularly concerning high-volume transactions typical in manufacturing industries (Casino et al., 2019). In contrast, classical systems excel in performance for high-volume transactions and offer more mature, tested security protocols (Kshetri, 2018). The implementation of blockchain solutions, especially smart contracts, requires specialized skills and careful design to avoid potential vulnerabilities (Azzi et al., 2019). Given these considerations, a hybrid approach that leverages the strengths of both blockchain and classical systems may prove to be the most effective solution for the Garut bamboo industry, balancing the need for transparency and security with scalability and performance requirements.

5. CONCLUSIONS

Organizational management design and information system architecture involving warehouse and production information systems and sales information systems, with the support of blockchain architecture, significantly strengthen bamboo product management. Integrating these two systems allows companies to manage production and sales processes more efficiently and effectively. Warehouse and production information systems precisely control raw material inventory, production planning, product quality monitoring, and inventory management. Meanwhile, the sales information system provides a responsive platform for customers to search, order, and process products using efficient inventory management. Using blockchain architecture increases data security, transparency, and product tracking to a higher level. In this way, the Garut bamboo industrial center can optimize operations, reduce the risk of errors, and provide a better customer experience, contributing to better business growth and sustainability.

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